

Appl. No. 10/808,741
Amndt. Dated Feb. 14, 2006
Reply to Office action of November 16, 2005

Amendments to the Drawings

The attached sheets of drawings include changes to FIGS. 1-3, 5-8. The sheets, which include FIGS. 1-8, replace the original sheets including FIGS. 1-8.

Attachment: Replacement sheets

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REMARKS

Applicant has carefully reviewed the Office action mailed November 16, 2005. In response to the Office action, Applicant has amended claims 1, 3-6, 10-14, and 16-20, and canceled claim 15. By way of this amendment, no new matter has been added. Claims 2 and 9 were previously withdrawn. Accordingly, claims 1, 3-8, 10-14, and 16-21 remain pending in this application. At least for the reasons set forth below, Applicant respectfully traverses the foregoing rejections. Further, Applicant believes that there are also reasons other than those set forth below why the pending claims are patentable, and reserves the right to set forth those reasons, and to argue for the patentability of claims not explicitly addressed herein, in future papers. Applicant respectfully requests reconsideration of the present application in view of the above amendments and the following remarks.

Information Disclosure Statement

United States Patent 5,056,763 to Hamada et al. is mentioned in the background section of the specification, but was not included in an information disclosure statement. Accordingly, an information disclosure statement disclosing this patent is submitted concurrently herewith including the fee set forth in 37 CFR 1.17(p).

Drawings

The drawings were objected to due to inappropriate crosshatch patterns used to depict cardboard, steel wire mesh, ceramic and adhesive layers. Accordingly, Drawing sheets 1, 2, and 4 have been replaced to amend the surface and section graphics of FIGS. 1-3 and 6-8. Applicant specifically notes that the crosshatch pattern for paper was used for cardboard, and the crosshatch pattern for refractory materials was used for ceramic. Further, Drawing sheet 3 has been replaced to amend handwritten element numbers (20 and 22) with typed element numbers.

Specification

The disclosure was objected to for the following:

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Paragraphs [030] and [032]

Paragraph [030] included the acronym NVH with no definition. Accordingly, Paragraph [030] has been amended to include the compound term 'noise, vibration and harshness', as known to one of skill in the art.

Paragraph [032] incorrectly identified 'mesh 38'. Accordingly, this term has been amended to read 'mesh 36.'

Dampening Insert

The Examiner has also objected to the description within the specification. Specifically, the Examiner asks the question "[i]f not the liner 34, what then constitutes the dampening insert in Figs. 7 and 8?"

Applicant respectfully notes that, in the restriction requirement mailed September 12, 2005, the Examiner contended the existence of two patentably distinct Species within the specification. (Election/Restriction Requirement, mailed September 12, 2005, page 2). These Species identified by the Examiner were "Species I shown in Figs. 1-6, and Species II, shown in Figs. 7 & 8." Id. In this objection to the specification, the Examiner identifies that "Page 9, lines 2-4 states that in Figs. 7 & 8 the 'liner 34 may be applied.... in place of a dampening insert' and contends this contradicts "page 8, lines 6 & 7 where it states the dampening insert is a liner." However, a complete quotation of these excerpts of the specification is as follows:

As shown in FIG. 1, the self dampening means *may* comprise a multi-piece liner designated generally by reference numeral 24. Liner 24 includes a heat resistant layer 26 which may comprise, for example, a flexible material such as cardboard or the like.

Applicant's Specification, paragraph [030], pages 8, *emphasis added*.

Turning now to FIGS. 7-8 there is shown an alternative embodiment of the self-dampening means of the present invention illustrated as an internal or external layer of the driveshaft component such as front propshaft 12. In this embodiment, liner 34 similarly includes a steel wire mesh or other suitable substrate 36 adapted to receive a ceramic layer 38. *However, in contrast to the first embodiment discussed above*, liner 34 *may* be applied directly to the internal or external surface of a desired driveshaft at the time of manufacture in addition to or in place of a dampening insert.

Applicant's Specification, paragraph [031], pages 8 and 9, *emphasis added*.

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Importantly, a close reading of the two passages provided immediately above indicates that the Examiner has taken two passages from the specification that may describe different embodiments to identify a contradiction. Previously, the Examiner felt strongly enough about the differences in these embodiments to issue an election/restriction requirement. (Election/Restriction Requirement, mailed September 12, 2005). More importantly, the Examiner has maintained this election/restriction requirement and will only examine claims related to Species I, with at least one embodiment illustrated in FIGS. 1-6, and will not examine claims directed only to Species II, with at least one embodiment illustrated in FIGS. 7-8. As is known to one of skill in the art, different embodiments may include identical, differing, and/or mutually exclusive features. This is the essence of an alternative embodiment. Thus, assuming *arguendo*, that a contradiction exists, then this contradiction would not be unacceptable when describing two differing embodiments.

Applicants also note that the Specification further provides that as “shown in FIGS. 3-6, liner 24 may then be rolled and *inserted* within a desired driveshaft component.” (Applicant’s Specification, paragraph [030], lines 12-13 *emphasis added*). Accordingly, the liner 24 may be referred to as a ‘dampening insert’. Further, the Specification also states “the self dampening means *may* comprise a multi-piece liner designated generally by reference numeral 24.” (Applicant’s Specification, paragraph [030], lines 2-3 *emphasis added*). Therefore, the liner 24 is referred to as an item that is inserted, and as an item that has dampening qualities.

A closer reading of the quotation above from Applicant’s Specification, paragraph [031], page 9, reveals that “liner 34 *may* be applied directly to the internal or external surface of a desired driveshaft at the time of manufacture *in addition to or in place of a dampening insert*.” (*emphasis added*). Accordingly, to the extent that the ‘dampening insert’ mentioned in paragraph [031] refers to embodiments of the liner 24, embodiments of the liner 34 may be used alone or in combination with these embodiments of the liner 24, as desired by one of skill in the art. Additionally, the text of the quotation above from paragraph [031], as read by one of skill in the art, does not indicate that a ‘dampening insert’ is necessarily illustrated in FIGS. 7 and 8, but only acknowledges an embodiment where the liner 34 may be “in addition to or in place of a dampening insert.” (Applicant’s Specification, paragraph [031], page 9).

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Antecedent Basis for Claim Language in Specification

The Specification was objected to for allegedly failing to adequately support the following limitations of the following claims:

Claims 8 and 18, "stainless steel"

Claim 11, "a tube-like section"

Claims 11-16, 19, 20 "ceramic insert"

Claims 13 and 14 all limitations.

Applicants note that paragraph [032] has been amended to include a reference to stainless steel. Support for this amendment can be found in claims 8 and 18.

Applicants also note that Claims 11-16, 19, 20 have been amended to clarify the limitations contained therein by replacing the terms "a tube-like section" and "ceramic insert" with terms that also find support within the specification. Incidentally, the term 'ceramic insert' is found in paragraph [033].

Furthermore, the limitation of claim 13 has been amended to recite "ceramic liner is attached to a predetermined section of said tube section." Support for the limitations of claim 13 and 14 can be found, at least, in paragraph [033].

Abstract

The Abstract was objected to due to the use of the word 'means'. Accordingly, the Abstract has been amended to delete the use of a means expression. Support for the newly added wording to the Abstract can be found in Applicant's Specification, paragraph [030], page 8.

In view of the above-described amendments to the Specification, amendments to the Claims and remarks, removal of the objections to the Specification by the Examiner is respectfully requested.

Claim Rejections – 35 U.S.C. § 112

35 U.S.C. § 112, First Paragraph

Claims 3-21 were rejected under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the enablement requirement. Applicant respectfully traverses the rejection.

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a. Claims 3, 16 and 18

The Examiner notes that claims 3, 16, and 18 include the limitation "substantially rigid substrate." The Examiner also notes that one embodiment is described as including a flexible substrate. Accordingly, claims 3, 16, and 18 have been amended to delete 'substantially rigid'.

b. Claims 4 and 20

The Examiner notes that claims 4 and 20 identify the liner as "removable," and points specifically to passages within the specification that mention that embodiments of the liner may be bonded. The Examiner further defines bonded as 'non-removable'. However, the Specification does not contain the term "non-removable" and nowhere in the Specification does the Applicant suggest that the liner is not removable in all embodiments. Specifically, paragraph [030], lines 14-15 provides that the "liner 24 *may* be attached to an inside surface of the propshaft 12 by any known bonding technique." (*emphasis added*). Accordingly, one of skill in the art would recognize that the liner may be removable since the bonding techniques are not specifically taught as providing a non-removable attachment.

c. Claim 11

The Examiner states that claim 11 recites that the liner is "on or near" a surface of the tube section. Accordingly, claim 11 has been amended to clarify that the liner is "coupled to a surface of said tube section."

d. Claim 16

The Examiner states that "Claim 16 recites that that substrate of the insert is 'coated with said ceramic,'" and contends that "the specification teaches *only* that the ceramic layer 30 is conformally deposited on the substrate 28." (Non-Final Office Action dated November 16, 2005, page 6, *emphasis added*). In contrast, the Specification provides:

Liner 24 further includes a flexible substrate 28 which may comprise, for example, a steel wire mesh or any other suitable material adapted to *receive and sustain a layer 30 of ceramic*. In the preferred embodiment shown, ceramic layer 30 is conformally deposited by known techniques atop substrate 28. Such depositing operation *may include*, for example, chemical vapor deposition *or any suitable means for achieving the desired result*.

Applicant's Specification, paragraph [030], page 8, (*emphasis added*).

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Applicant submits that one of skill in the art would readily recognize that Applicant's Specification teaches that a ceramic layer may be applied to a substrate, such as a wire mesh, by a process, such as chemical vapor deposition (CVD), with the resulting liner including a substrate that is at least partially coated with the ceramic. One of skill in the art would also recognize that the amount of infiltration of the ceramic within the wire mesh could be controlled by a CVD apparatus, depending on whether one desires to 1) coat only an outer portion of a surface of the wire mesh or 2) coat portions of the wire mesh through the surface of the wire mesh that the ceramic is applied to, or 3) apply the ceramic only to the outer surface of the wire mesh. Further, one of skill in the art would recognize that CVD, or other application processes, of a ceramic onto a wire mesh may coat the wires or may be deposited substantially on the surface of the wires depending on other factors, such as 1) whether the wire mesh is tightly woven or loosely woven, and 2) whether the surface of the wire mesh opposing the surface of deposition is masked, thereby permitting the deposition process to create a localized pressure zone that prevents deposited particles from reaching portions of the wire mesh near the masked surface.

Accordingly, Applicant submits that the specification, as viewed by one of skill in the art, provides a variety of embodiments of ceramic applied to a substrate, such as a wire mesh, including coating, partial coating and surface application using CVD, as is known to those of skill in the art.

35 U.S.C. § 112, Second Paragraph

a. Claims 1 and 10

Claims 1 and 3-21 were rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Applicant respectfully traverses the rejection.

Specifically, the Examiner, referring to claims 1 and 10, states that "it is not clear how a dampening means absorbs its own vibration energy and increases its own 'resonant frequency of bending'." (Non-Final Office Action dated November 16, 2005, page 6). To be clear, claims 1 and 10, prior to this amendment, never recited that the damping means "absorbs its own vibration energy and increases its own 'resonant frequency of bending'." Specifically, claim 1 recited a "damping means to absorb vibration energy *of the rotary shaft* and increase resonant frequency of bending *of the shaft*." (*emphasis added*).

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To assist the Examiner in understanding how a dampening means may absorb vibration energy of a rotary shaft, Applicant points to paragraph [005] of the Specification which provides:

Dynamic dampers and mass dampers have heretofore been used to suppress undesirable vibrations that are induced in rotary driveshafts due to unbalanced rotation. Such dampers are often installed or inserted directly onto the rotary driveshafts. See, for example, U.S. Pat. No. 5,056,763 to Hamada, et al. As disclosed, the dynamic damper of Hamada, et al. comprises a pair of ring shaped fixing members spaced apart at predetermined intervals with a mass member disposed therebetween. A pair of connecting members are then provided to connect the ends of the fixing members to the ends of the mass member. In operation, the Hamada et al. damper *transfers and absorbs the vibrational energy of the rotary drive shaft* by generating a prescribed vibrational frequency adjusted to the dominant frequency of the vibrations. The dynamic damper thus cancels or negates vibrations that are induced onto or caused by the rotary driveshaft in normal operation of the drive train of the vehicle. As readily seen, however, the Hamada et al damper does not address, let alone increase, the threshold resonant frequency at which harmful bending of the driveshaft will occur in the first place.

Applicant's Specification, paragraph [005], lines 1-4, *emphasis added*.

Additionally, the above referenced US Patent 5,056,763 to Hamada also provides that:

When a rotary shaft, such as a drive shaft and a propeller shaft of an automobile and the like, rotates, unbalanced rotations occur. As a result of the unbalanced rotations, there occurs harmful vibrations like bending vibrations and torsional vibrations. It is preferred that the harmful vibrations should not occur at all. However, dynamic dampers have been widely used to suppress the harmful vibrations. The dynamic dampers work in the following manner: The dynamic dampers adjust their intrinsic frequencies to the dominant frequencies of the excited harmful vibrations, convert the vibration energy of the rotary shaft to the vibration energy of the dynamic dampers by resonance, *and absorbs the vibration energy of the rotary shaft*.

United States Patent 5,056,763 to Hamada, column 1, lines 11-24, *emphasis added*.

Accordingly, rotary shafts may include dampers, such as inserts and other damping means, to absorb vibration energy of the rotary shaft.

Incidentally, Claim 1 has been amended to positively recite "a liner, including a cardboard layer and a ceramic layer, to absorb vibration energy of the rotary shaft and increase the

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resonant frequency of bending of the shaft," and claim 10 has been amended to recite "the liner increases the resonant frequency of bending of the shaft by about 35%."

b. Claim 4

The Examiner notes that claim 4 recited 'removable' without specifying the element from which said means is removable. Accordingly, Claim 4 has been amended to positively recite that "the liner is removable from the shaft."

c. Claim 11, tube-like

The Examiner states that the addition of the modifier '-like' to the term 'tube-like section' renders the term indefinite. Accordingly, Claim 11 has been amended to delete the modifier '-like' from the term 'tube section'.

d. Claim 11, near

The Examiner states that the addition of the term 'near' renders the claim indefinite. As noted above, Claim 11 has been amended to delete the word 'near'.

e. Claim 13

The Examiner states that it is not clear how the insert may be arranged at separate, distinct locations. Accordingly, Claim 13 has been amended to positively recite that the "liner is attached to a predetermined section of said tube section."

f. Claim 16

The Examiner notes there is insufficient antecedent basis for "said ceramic." Accordingly, Claim 16 has been amended to positively recite "a ceramic."

Claim Rejections - 35 U.S.C. § 101

Claims 1 and 3-21 were rejected under 35 U.S.C. § 101 as lacking patentable utility. For at least the following reasons, Applicant respectfully traverses the rejection.

The Examiner grossly misquotes paragraph [028] of the Specification by stating that "the utility of the invention is disclosed simply as a means to prevent undesirable noise in a car's passenger compartment when the car is involved in a frontal crash." (Non-Final Office Action dated November 16, 2005, page 7). To be clear, paragraph [028] provides:

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As indicated above, propeller shafts ("propshafts") 12 and 16 function to *transfer torque* to the rear axle in rear wheel and all wheel drive vehicles. These propshafts are typically rigid in the axial direction and under certain circumstances, can contribute to the *transfer of force* down the fore-to-aft axis of the vehicle on impact, particularly in a frontal crash. *Such transfer of energy* can lead to high forces in the vehicle and thus high rates of acceleration for the occupants. Further, such energy can contribute to uncontrolled buckling of the propshaft itself resulting in damage to the passenger compartment or fuel tank from puncturing or the like. Still further, *such energy creates excessive and undesirable vibrations, i.e. noise, in the passenger compartment.*

Applicant's Specification, paragraph [028], (*emphasis added*).

A close reading of paragraph [028], as readily understood by one of skill in the art, reveals that the vibrations and noise are created by the transfer of energy in the form of torque in the rotating propshafts. Brief mention is also made to forces (*not energy*) transferred in the vehicle. A transfer of force, even during an impact, is not a transfer of energy. A transfer of energy requires motion, such as the rotation of a propshaft. Paragraphs [023]-[027] detail the rotation of the propshafts and the transfer of torque therethrough.

Additionally, the specification is replete with examples of utility, including paragraphs [008], [009], [010], [011], [013], [029] and [033]. Specifically, paragraph [029] details the utility of embodiments by stating:

The present invention addresses and overcomes the aforementioned problems by providing an improved propeller shaft having self-dampening means for *inhibiting undesirable noise caused by rotary motion of the rear axle and/or clutch of the motor vehicle.*

Applicant's Specification, paragraph [029], (*emphasis added*).

Accordingly, the utility of the subject matter of claims 1-14 and 16-21 is readily apparent in at least paragraph [029]. Therefore, reconsideration and withdrawal of this rejection is respectfully requested.

Claim Rejections – 35 U.S.C. § 102

Claims 1 and 10 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 4,392,681, to Raquet.

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Claims 1 and 10 were rejected under 35 U.S.C. § 102(b) as being anticipated by Great Britain Patent 1,463,170, to Verney.

Claims 1 and 10 were rejected under 35 U.S.C. § 102(b) as being anticipated by SAE Universal Joint and Driveshaft Design Manual (no date supplied), (hereinafter SAE). For at least the following reasons, Applicant respectfully traverses the rejections over Raquet, Verney, and SAE.

To anticipate a claim, the reference must teach every element of the claim. A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the ... claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). “[T]he reference must describe the applicant's claimed invention sufficiently to have placed a person of ordinary skill in the field of the invention in possession of it.” *In re Spada* 911 F. 2d 705, 708, 15 USPQ2d 1655, 1657 (Fed. Cir. 1990).

“There must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the field of the invention.” *Scripps Clinic & Research Foundation v. Genentech Inc.* 927 F.2d 1565, 18 USPQ2d 1001, 1010 (Fed. Cir. 1991).

Independent claim 1, as amended, positively recites a “a liner, including a cardboard layer and a ceramic layer.” In contrast, Raquet, Verney, and SAE do not teach a cardboard layer and a ceramic layer, and thus, do not teach every limitation of independent claim 1, as required in *Verdegaal Bros.* Dependent claim 10 is also patentable by being dependent on an allowable base claim. Accordingly, reconsideration and withdrawal of these rejections is respectfully requested.

Claims 1, 3-5, 7, 8, 10-16, and 19-21 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent 4,059,712, to Bothwell. For at least the following reasons, Applicant respectfully traverses the rejection.

Independent claim 1, as amended, positively recites a “a liner, including a cardboard layer and a ceramic layer, wherein the liner is selectively coupled to a portion of the shaft to absorb vibration energy of the rotary shaft.” In contrast, Bothwell does not teach a cardboard layer and a

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ceramic layer. Additionally, Bothwell makes no mention of absorbing vibration energy. Thus, Bothwell does not teach every limitation of independent claim 1, as required in *In re Spada*.

The Examiner states that Bothwell teaches, in FIGS. 4-6, a "heat resistant layer 24, 26." Independent claim 11, as amended, positively recites a "ceramic liner having a heat resistant layer." In contrast, Bothwell teaches "thin air gaps between the layers" (column 9, line 9) and that "shown in FIG. 6, spaced, spirally wound heat resistant wires, such as shown at 24, 26, between the layers, provide the spacing" (column 9, lines 19-21). Therefore, Bothwell does not teach a heat resistant layer. The teaching of Bothwell of spaced, heat resistant wires within an air gap does not teach a heat resistant layer since the air within the air gap is not taught as heat resistant, and the wires are taught only as spaced, thereby teaching away from a layer.

Dependent claim 3-5, 7, 8, 10, 12-16, and 19-21 teach independently patentable subject matter, although they are also patentable merely by being dependent on an allowable base claim. As an example, claim 12 recites the "ceramic liner is bonded to an inside surface of said tube section." These teachings are not taught in the prior art of record. Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

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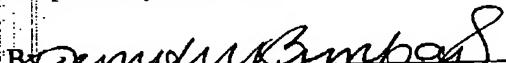
Conclusion

In view of the above, each of the presently pending claims in this application is in immediate condition for allowance. If, however, there are any outstanding issues that can be resolved by telephone conference, the Examiner is earnestly encouraged to telephone the undersigned representative. Accordingly, the Examiner is respectfully requested to pass this application to issue.

Applicant believes that no fee is due with this response. However, if a fee is due, please charge Deposit Account No. 07-1360, from which the undersigned is authorized to draw.

Respectfully submitted,

Dated: February 14, 2006

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